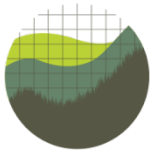

February 12, 2020

To: Office of Ground Water and Drinking Water, EPA

Subject: Comments on National Primary Drinking Water Regulations: Lead and Copper Rule Revisions (84 Fed. Reg. 61,684, Nov. 13, 2019)

Docket: EPA-HQ-OW-2017-0300

The Institute for Policy Integrity at New York University School of Law[1] respectfully submits these comments on EPA's proposed revisions to the National Primary Drinking Water Regulation for lead and copper.[2] Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.

These comments focus on the proposal's analysis of costs, benefits, and regulatory alternatives. The proposed revisions are estimated to deliver tens of millions to hundreds of millions of dollars in monetized, annualized *net benefits* when calculated using a 3% discount rate, but tens of millions to hundreds of millions of dollars in monetized, annualized *net costs* when calculated using a 7% discount rate.[3] On the basis of these cost-benefit comparisons, and after considering the proposed revisions' many and potentially significant non-monetized benefits, EPA concludes that the revisions' benefits justify their costs.[4] EPA does not fully clarify, however, whether this final determination could be based independently either on consideration of just the additional non-monetized benefits or just the calculations at a 3% discount rate, or if instead the agency is relying to some extent on both a preference for the 3% discount rate-based calculations and also the potentially significant non-monetized benefits.[5]

EPA should first reassess whether any of the currently non-monetized benefits could in fact be monetized. For example, even if there is some uncertainty about the precise magnitude of the effect, the risk of cardiovascular mortality from lead exposure is not zero, and even a small quantified benefit of avoided mortalities could have a significant impact on the cost-benefit analysis. EPA should review, on the basis of all reliable studies and public comments, whether it can quantify and monetize some reasonable ranges of estimated benefits for any currently non-monetized benefit categories.

After quantifying and monetizing all effects that can reasonably be quantified and monetized, EPA should then consider whether it believes that the remaining non-monetized benefits are likely significant enough to offset the calculations of negative monetized net benefits at a 7% discount rate. If so, EPA should explicitly state that to be the case. A breakeven analysis would be a more formalized way to assess the significance of the non-monetized benefits.

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[1] This document does not purport to present New York University School of Law's views, if any.

[2] 84 Fed. Reg. 61,684 (Nov. 13, 2019).

[3] *Id.* at 61,730.

[4] *Id.* at 61,734.

[5] *Id.* (explaining, after first noting that the proposed rule's net benefits are negative at a 7% discount rate, that "In addition to the monetized benefits of the proposed rule, a number of potentially significant non-quantified and non-monetized sources of benefit exist that *further strengthen the determination* of benefits justifying costs"—perhaps thereby implying that even before consideration of non-monetized benefits, a determination of benefits justifying costs can be made based on monetized costs and benefits alone, despite the net negative calculations at the 7% discount rate).

EPA should also consider whether there are strong reasons to favor the calculations based on a 3% or lower discount rate, or at least to disfavor calculations based on a 7% discount rate. A 3% or lower discount rate is likely more appropriate given both the special nature of the benefits (in particular the IQ-related income effects that will occur over the next 100 years to future generations of yet-to-be-born individuals) and also perhaps based on the special nature of the costs (which largely fall on publicly-owned water systems and households, both of which may have a different social rate of time preference and opportunity cost of capital than private entities, and which also have access to public financing to support compliance expenditures).

More explicit statements on both the significance of the non-monetized benefits and the appropriate discount rate will strengthen EPA's determination that the revisions' overall benefits justify their costs.

Indeed, in light of the significant non-monetized benefits at stake in reducing exposure to lead and copper, as well as the reasons to favor a lower discount rate, even more protective regulatory alternatives could also be cost-benefit justified. EPA has not sufficiently explored several obvious alternatives, and the agency should do so and then select in the final rule the regulatory alternatives that best maximize net social welfare and address environmental justice.

1. EPA Should Monetize All Benefits That Can Reasonably Be Monetized, and Then Use Breakeven Analysis to Assess the Non-Monetized Benefits

The only monetized benefits currently in the regulatory analysis are the increases in lifetime earnings from avoided IQ point decrements associated with childhood exposure to lead, as related to just a few of the proposed revisions' requirements (namely, CCT and LSLR/POU).[6] Changes in exposure resulting from the proposed requirements for education, lead service line inventories, "find-and-fix"-type improvements, homes without lead service lines, and other aspects of the rules were not quantified.[7] Multiple adverse health effects associated with lead exposure, including cardiovascular effects, reproductive and developmental effects, immune effects, hypersensitivity and allergy response, resistance to bacterial infection, neurological effects (besides IQ from childhood exposure), cancer,[8] and other non-IQ health endpoints in children[9] were not quantified or monetized. None of the health effects associated with copper exposure, including gastrointestinal disorders and liver effects, were quantified or monetized.[10]

EPA characterizes the proposed rule's non-monetized benefits as "potentially significant" and relies on them to "further strengthen the determination of benefits justifying costs."[11] However, it is not entirely clear whether EPA believes that the proposed rule's non-monetized benefits are likely significant enough to justify the $91 million-$189 million in net negative monetized, annualized effects calculated at a 7% discount rate, or else whether EPA is favoring the cost-benefit calculations conducted at a 3% discount rate (see next section of these comments on reasons to favor a 3% or lower discount rate).

EPA should first ensure that all important categories of benefits that can reasonably be monetized have been monetized. White House guidance on cost-benefit analysis requires agencies to quantify important effects "to the fullest extent that the[y] can be usefully estimated";[12] the Safe Drinking Water Act

[6] 84 Fed. Reg. at 61,727-30.
[7] *Id.* at 61,731.
[8] EPA, Proposed LCRR Economic Analysis, Appendix D (2019) [hereinafter, "Economic Analysis"].
[9] *Id.* at Appendix H.
[10] *Id.* at Appendix E.
[11] 84 Fed. Reg. at 61,734.
[12] Exec. Order No. 12,866 § 1(a).

requires EPA to weigh all "quantifiable . . . health risk reduction benefits for which there is a factual basis"[13]; and courts do not allow agencies to use uncertainty as an excuse for failing to monetize key categories of benefits, especially when the benefit's monetized value "is certainly not zero."[14] To that end, EPA should reassess whether any important categories of currently non-monetized benefits could in fact be monetized using a reasonable range of estimates that accounts for uncertainty.

In particular, EPA should reassess whether cardiovascular mortality effects could be monetized. EPA has already concluded that there is a causal relationship between lead exposure and cardiovascular mortality; the only question is the precise magnitude of the risk.[15] However, the risk of cardiovascular mortality from lead exposure is not zero, since "[c]ollectively, the literature supports the hypothesis that there is not an identifiable population threshold for lead and the outcome of CVD mortality, and that the association between blood level and CVD mortality is expected to hold in cohorts with declining blood lead levels."[16] Because EPA in general values mortality risk reductions at over $10 million per avoided death,[17] even a relatively small decrease in the risk of mortality from lead exposure could go a long way toward offsetting the rule's costs. Note, for example, that the results from Lanphear et al. 2018 indicate that decreasing lead exposure to 1.0 μg/dL would be associated with 412,000 avoidable deaths.[18]

EPA should ensure that it has reviewed all reliable studies on the lead-CVD mortality connection.[19] EPA should then quantify "to the fullest extent" a reasonable range of mortality benefits from its proposed rule, bearing in mind that the effect will not be zero. EPA should then apply the value of statistical life to monetize those benefits.

EPA should similarly quantify and monetize any other important categories of benefits that can be quantified or monetized.[20] Another potentially highly important category of benefit that could be monetized with some reasonable range of estimates may be benefits to children in homes with no LSL. EPA knows that these benefits will not be zero and may be highly significant. EPA reports that 14 million to 26 million homes with no LSL could experience an increase in CCT over the regulatory analysis period.[21] EPA claims that limited data and uncertainties prevent a full monetization, though EPA did explore monetization in a sensitivity analysis.[22] EPA's sensitivity analysis considered two geometric mean water lead concentration figures, using numbers "chosen from the raw data for these two treatment combinations."[23] EPA then estimated blood lead levels and "concluded that reasonably accurate blood lead predictions could be made using [linear regression] models."[24] EPA then applied its standard method for IQ point valuation, with "[t]he only difference [being] the change in the assumption of water

[13] Safe Drinking Water Act § 1412(b)(3)(C)(i)(I).

[14] Center for Biological Diversity v. NHTSA, 538 F.3d 1172, 1200 (9th Cir. 2008).

[15] Economic Analysis at D-5, I-18.

[16] *Id.* at I-26.

[17] *See, e.g.*, EPA, Regulatory Impact Analysis for the Repeal of the Clean Power Plan at 4-24 (2019) ("VSLs applied in this analysis in 2016$ after adjusting for income growth is $10.5 million for 2025.").

[18] Economic Analysis at I-23 to I-24.

[19] Studies that EPA might have overlooked include: Rajiv Chowdhury et al., *Environmental Toxic Metal Contaminants and Risk of Cardiovascular Disease: Systematic Review and Meta-Analysis*, BMJ, 362: k3310 (2018); Geir Bjorklund et al., *High Content of Lead Is Associated with the Softness of Drinking Water and Raised Cardiovascular Morbidity: A Review*, 186 Biological Trace Element Research, 384 (2018).

[20] For other data and methods for quantifying and monetizing the benefits of lead exposure, *see, e.g.*, Ronnie Levin, *The Attributable Annual Health Costs of U.S. Occupational Lead Poisoning*, 22 International J. Occupational & Envtl. Health 107 (2016).

[21] 84 Fed. Reg. at 61,725.

[22] *Id.*

[23] Economic Analysis at F-3.

[24] *Id.*

and thus blood lead concentration in the instances where there is no LSL."[25] The results are highly significant, with incremental annual benefits of this sensitivity analysis totaling hundreds of millions of dollars at a 7% discount rate,[26] enough to offset the proposed rule's annualized costs.[27]

Given the potential to switch the cost-benefit calculation at the 7% discount rate, it is surprising that EPA does not give the sensitivity analysis of non-LSL homes more attention in the rule's preamble. Circular A-4 recommends sensitivity analysis precisely to test for these kinds of "switch points," where changing a critical assumption results in changing the sign of the net-benefit calculation.[28] Circular A-4 instructs that if a sensitivity analysis results in "the value of net benefits chang[ing] from positive to negative (or vice versa) . . . you should conduct further analysis to determine which of the alternative assumptions is more appropriate."[29] Because EPA has both some "raw data" and "reasonably accurate . . . models" for valuing benefits to non-LSL homes, because monetizing the benefits could change the sign of its cost-benefit analysis, and because EPA knows that the benefits in this important category are certainly not zero, EPA should seriously consider whether it can include in its main cost-benefit analysis some reasonable range of estimates of benefits to non-LSL homes.

After quantifying and monetizing benefits "to the fullest extent," EPA should then give adequate weight to any remaining non-monetized benefits. Consideration of the rule's non-monetized benefits is both fully consistent with best practices for regulatory analysis[30] and also required by the Safe Drinking Water Act.[31] EPA should ensure that it has a sufficiently detailed qualitative discussion of any important effects that cannot currently be quantified.[32] OMB's Circular A-4 recommends including "detailed information on the nature, timing, likelihood, location, and distribution of the unquantified benefits and costs," and advises agencies to "use your professional judgment to highlight (e.g., with categories or rank ordering) those that you believe are most important (e.g., by considering factors such as the degree of certainty, expected magnitude, and reversibility of effects)."[33]

After making such professional judgments, EPA should then more explicitly state whether it believes the rule's non-monetized benefits are significant enough to offset or justify any remaining net negative monetized effects as calculated at a 7% discount rate. Circular A-4 recommends breakeven analysis as a more formalized approach to evaluate the significance of non-quantified benefits.[34] Essentially, breakeven analysis asks the agency how small either the incidence or the valuation of a regulatory

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[25] *Id.* at F-10.

[26] *Id.* at F-10 to F-11.

[27] *See* 84 Fed. Reg. at 61,730.

[28] Circular A-4 at 41.

[29] *Id.* at 42.

[30] *See, e.g.*, Circular A-4 at 2 (reminding agencies that "the most efficient alternative will not necessarily be the one with the largest quantified and monetized net-benefit estimate" and that, instead, they should assess the significance of important non-quantified benefits and costs); *id.* at 26-27 (detailing the methods for assessing non-monetized benefits and costs); Exec. Order No. 12,866 § 1(a) ("Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider."); *see also,* Amicus Br. of the Institute for Policy Integrity, Murray Energy Corp. v. EPA, No. 16-1127 at 23-29 (D.C. Cir., submitted Jan. 25, 2017), https://policyintegrity.org/documents/MATS_Final_Brief.pdf (detailing the longstanding regulatory practices and caselaw that support consideration of unquantified benefits).

[31] Safe Drinking Water Act § 1412(b)(3)(C)(i)(I)-(II) (requiring consideration when setting maximum contaminant levels of nonquantifiable health risk reduction benefits for both the target contaminant and any co-occurring contaminants).

[32] *Compare, e.g.*, Chowdhury et al., *supra* note 19 (discussing the significant association between copper exposure and cardiovascular disease) *with* Economic Analysis at E-1 (not mentioning copper's relationship to cardiovascular disease).

[33] Circular A-4 at 27; *see also id.* at 2 ("[Y]ou should indicate, where possible, which non-quantified effects are most important and why.").

[34] *Id.* at 2.

benefit could be and still offset the rule's costs. EPA should more explicitly characterize the significance of the most important non-monetized benefits from the proposed revisions.

2. The Special Nature of the Rule's Benefits and Costs Indicates That a 3% or Lower Discount Rate May Be More Appropriate

To begin, EPA should clarify exactly which discount rates it is using. Throughout almost the entire preamble of the proposed rule, including its various exhibits and tables, as well as in the supporting economic analysis and appendices, EPA uses both a 3% and 7% discount rate. Indeed, EPA states that "[i]n accordance with the EPA's policy, and based on guidance from the Office of Management and Budget (OMB), when calculating social costs and benefits, the EPA discounted future costs (and benefits) under two alternative social discount rates, 3 percent and 7 percent."[35]

But confusingly, in the very next sentence, EPA seemingly contradicts that statement: "When evaluating the economic impacts on PWSs and households, the EPA uses the estimated PWS cost of capital to discount future costs, as this best represents the actual costs of compliance that water systems would incur over time."[36] The appendices to the supporting economic analysis then contain a discussion and tables showing how EPA used data from 2006 on factors like revenue, grants, and borrowing to calculate the weighted average cost of capital for various water systems, ranging from 3.7%-6.1% for publicly owned water systems of various sizes, and from 3.9%-8.6% for privately-owned water systems of various sizes.[37]

Yet despite that pronouncement about what "best" represents actual costs, and despite the calculations in the appendices, it is not clear where, if at all, in the proposal rule's preamble, economic analysis, or other supporting documents such PWS-specific cost of capital estimates are ever used as discount rates. Again, throughout the rule's discussion of costs and benefits, all figures seem to be discounted and annualized at 3% and 7% rates, not at some other PWS-specific rates. It is possible that EPA intended to make some distinction between discounting when "calculating *social* costs and benefits" (where it would use the 3% and 7% rates) versus discounting when "evaluating the *economic impacts* on PWSs and households" (where perhaps it planned to use some PWS-specific rates), but which calculations—if any—are actually based on the PWS-specific rates is not clear.[38]

Moreover, there are multiple concerns with the methodology for calculating the PWS-specific figures. Besides "missing data," the underlying memorandum that details the methodology notes that "small sample sizes" and inflexible assumptions resulted in some surprising outcomes, such as the fact that there is no clear trend of rates by size category[39]: for example, while EPA calculates that both the very

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[35] 84 Fed. Reg. at 61,713.

[36] *Id.*

[37] EPA, Proposed LCRR Economic Analysis Appendices at B-5 (2019) (also referencing at footnote 6 a cost of capital approach memorandum in the docket); *see also* Memorandum from Abt Assoc. to Erik Helm, Approach to Calculating Cost of Capital (Feb. 23, 2015) [hereinafter "Abt Memo"].

[38] There are two tables in the Economic Analysis Appendices that refer to annualizing costs based on "the annual cost of capital" for water systems of various sizes. *See* Economic Analysis at C-299 & C-302. The tables do not explicitly state that they are using the PWS-specific cost of capital figures calculated earlier in the analysis. While the tables show breakdowns of annualized cost based on system size and water source, the tables make no distinction between publicly-owned versus privately-owned systems, despite the fact that EPA calculated very different weighted average cost of capital figures for water systems of the same size but with different ownership structures. *See id.* at B-5. It is also unclear how these two sets of tables relate to other summaries of total costs that appear throughout the rule and the economic analysis, which routinely present "annualized costs, discounted at 3 percent and 7 percent," *e.g.*, *id.* at 5-1.

[39] Abt Memo, *supra*, at 4; *see also* 84 Fed. Reg. at 61,713 (explaining EPA had no estimates for NTNCWS and so just assumed the CWS figures would apply to NTNCWS as well).

largest and the very smallest privately-owned systems would have a rate of 7.8%, the second-largest private systems instead have an estimated rate of just 3.9%.[40] EPA offers no explanation for this or other inconsistencies.[41]

Additionally, the underlying data comes from 2006. Economic circumstances have changed since 2006. In fact, in 2017, the U.S. Council of Economic Advisers reviewed OMB's original selection in the year 2003 of default discount rates of 3% and 7%, and found good reason, based on more recent data and trends, to revisit and reduce both numbers.[42] Similarly, in 2006, OMB calculated the real 30-year treasury interest rate at 3%; for year 2020, OMB now calculates the rate at 0.4%, the lowest it has ever been since 1979; meanwhile, shorter-term treasury interest rates are currently negative, as they often have been since 2013.[43]

Finally, because of government funding for lead remediation that has become available since 2006, as well as additional funding that may become available in the future to help implement the proposed revisions, the "[t]otal estimated cost of capital may be greater than actual costs water systems bear when complying," as EPA admits.[44] In other words, the cost of capital figures are likely overestimated. EPA tries to distinguish that "[t]he availability of funds from government sources, while potentially reducing the cost to individual PWSs, does not reduce the social cost of capital to society."[45] However, even to the extent that is true, the social rate of time preference typically points toward a default discount rate of 3%, not 7%.[46]

Indeed, for both the costs and the benefits of the proposed revisions, there are good reasons to favor a 3% or lower discount rate, and to disfavor calculations based on a 7% rate. While it is true that OMB's Circular A-4 advises to use both 3% and 7% discount rates as defaults in a regulatory analysis,[47] Circular A-4 also makes clear that there are circumstances where the appropriate discount rate will fall outside that range,[48] and instructs agencies to always "use sound and defensible values"[49] and to justify the discount rate selected.[50] In the case of the costs and benefits at stake here, a 3% or lower discount rate

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[40] Abt Memo, *supra*, at 4.

[41] The rates reported by length of loan period also seem to fluctuate randomly, *id.* at 4 (e.g., a 30+-year loan for private systems in the 50,001-100,000 range has a rate of just 1.3%, but for just a slightly larger private system, in the 100,001-500,000 range, the rate jumps to 5.4%, with no explanation), and also possibly are inconsistent with the rates reported across all funding sources, *compare id.* at Table 4 *with* Table 3 (for example, for public systems in the 100,001-500,000 size range, no rate for any loan period length exceeds 4.5%, and short-term loans have a 0% rate, and yet across "all funding sources," EPA estimated an average rate of 4.7% for public systems of this size). It is not clear why the statistics for specific loan timeframes were only calculated across select funding sources or if missing data contributed to the inconsistencies here. *See id.*

[42] CEA, *Discounting for Public Policy: Theory and Recent Evidence on the Merits of Updating the Discount Rate* (Jan. 2017), https://obamawhitehouse.archives.gov/sites/default/files/page/files/201701_cea_discounting_issue_brief.pdf. *See also* Qingran Li & William A. Pizer, *Discounting for Public Cost-Benefit Analysis* (2019, NBER Working Paper No. 25413) (rethinking the appropriate discount rates for cost-benefit analysis).

[43] *See* OMB, Budget Assumptions: Nominal Treasury Interest Rates for Different Maturities (Nov. 5, 2019), https://www.whitehouse.gov/wp-content/uploads/2019/12/discount-history.pdf.

[44] 84 Fed. Reg. at 61,713.

[45] *Id*. at 61,713-14.

[46] OMB, Circular A-4 at 33 (2003).

[47] *Id.* at 34.

[48] *Id.* ("In some instances, if there is reason to expect that the regulation will cause resources to be reallocated away from private investment in the corporate sector, then the opportunity cost may lie outside the range of 3 to 7 percent."); *id.* at 36 ("If your rule will have important intergenerational benefits or costs you might consider a further sensitivity analysis using a lower but positive discount rate.").

[49] *Id.* at 27; *id.* at 3 ("You cannot conduct a good regulatory analysis according to a formula. Conducting high-quality analysis requires competent professional judgment.").

[50] *Id.* at 3 ("State in your report what assumptions were used, such as . . . the discount rates applied to future benefits and costs," and explain "clearly how you arrived at your estimates.").

based on the social rate of time preference, rather than a 7% rate based on private sector returns to capital, may be more defensible.

Costs: EPA calculates that the "vast majority of the costs" of the proposed revisions would be borne by public entities.[51] Publicly-owned[52] or tribal PWSs will bear 83% of the annualized costs under the low-cost estimates,[53] and 86% of the high-cost estimates.[54] That does not even include the costs to wastewater treatment plants ("most of which are publicly owned"),[55] or the costs to any federally-owned systems.[56] Additional costs fall directly on individual households,[57] as well as administrative costs to local governments.[58] By comparison, costs falling in the first instance on privately owned[59] entities are the clear minority of total costs. That breakdown of costs borne by public entities and individuals rather than private companies, as well as the availability of government grants and financing discussed above, both may support a reconsideration of the default discount rates as generally recommended in Circular A-4.

Circular A-4 makes clear that a 7% rate is meant to reflect returns to private capital and so "is the appropriate discount rate whenever the main effect of a regulation is to displace or alter the use of capital in the private sector."[60] However, that is most likely not the main effect of the proposed regulatory revisions. Instead, the proposed revisions will mainly affect the use of funds (including government funds and financing) available to publicly-owned entities and to individual households. Circular A-4 explains that when regulation primarily affects consumption, as opposed to primarily displacing private capital, a "lower discount rate is appropriate"—namely, a 3% rate that reflects the "social rate of time preference" and is based on the rate of return to long-term government debt. (Note that, in 2017, the Council of Economic Advisers suggested lowering this rate from 3% to 2%.[61])

Because the regulatory costs here implicate decisions about how governments will allocate funding, how publicly-owned entities will spend their resources, and how individual households will make consumption decisions, a 3% or lower discount rate may be more appropriate. EPA should consider what the primary effects of its proposed regulation are and should examine Circular A-4's recommendations on discounting in that light. In addition to considering whether the regulation will tend to displace private capital or else instead affect consumption and bear more directly on society's temporal preferences for consumption and welfare, EPA should also consider the role of taxation. Part of the reason why economic theory has historically predicted a divergence between the private rate of return to capital (with an associated 7% discount rate) and the rate of return that savers earn (more associated with a 3% discount rate) is taxation on private capital.[62] To the extent that publicly-owned

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[51] Economic Analysis at 8-19.

[52] By "publicly owned," EPA means owned by a government. *See* EPA, *2006 Community Water System Survey Report: Volume I*, at 8 (2009) ("The overwhelming majority of publicly owned [CWSs] are the property of towns, cities, counties, or other forms of local government.").

[53] *Compare* Economic Analysis at 8-19 ($91.4 million + $683,000 in public PWS and tribal PWS costs) *with* 84 Fed. Reg. at 61,723 ($111 million in total annual PWS costs).

[54] *Compare* Economic Analysis at 8-19 ($205.95 million + $1.36 million in public PWS and tribal PWS costs) *with* 84 Fed. Reg. at 61,723 ($242.2 million in total annual PWS costs).

[55] Economic Analysis at 8-19.

[56] *Id.*; though note that, for purposes of this analysis, public-private partnerships are counted as public systems, *id.*

[57] 84 Fed. Reg. at 61,723 (reporting household lead service line replacement costs); Economic Analysis at 5-218 (calculating annualized costs per household).

[58] 84 Fed. Reg. at 61,723 (reporting state rule implementation and administration costs).

[59] Note that a fair number of privately owned CWSs are run as not-for-profit entities. *See* Community Water System Survey Report, *supra*, at 8 (tallying 38% of privately owned CWSs as not-for-profits).

[60] Circular A-4 at 33.

[61] CEA, *Discounting for Public Policy*, *supra*, at 1.

[62] Circular A-4 at 33.

water systems or public financing of lead remediation projects may face different tax implications than traditional private capital, a different discount rate may be appropriate.

Benefits: The only monetized benefits currently tallied in the regulatory analysis are the avoided decreases in lifetime earnings from IQ point decrements associated with childhood exposure to lead.[63] While EPA bases its benefits calculation on a 35-year timeline of potential future exposure to lead (i.e., from 2020-2055), the benefits to a 7-year-old protected from lead exposure in the 35th year of the regulation's implementation (i.e., in year 2055) include that 7-year-old's lifetime earnings based on an assumed future retirement upon reaching age 65 (i.e., in year 2113).[64] That 7-year-old's lifetime of income benefits is then discounted back to year-one of the analysis.[65] In short, EPA's calculation of monetized benefits include income benefits that will not occur until next century and that will accrue to future generations of individuals who will not even be born for 28 more years. In other words, a large portion of EPA's monetized benefits are *intergenerational* benefits.

Circular A-4 indicates that significant intergenerational effects warrant a special sensitivity analysis focused on discount rates even lower than 3%: "Special ethical considerations arise when comparing benefits and costs across generations. . . . It may not be appropriate for society to demonstrate a similar preference when deciding between the well-being of current and future generations. . . . If your rule will have important intergenerational benefits or costs you might consider a further sensitivity analysis using a lower but positive discount rate."[66] More recently, in 2015, OMB explained that "Circular A-4 is a living document," and that "the use of 7 percent is not considered appropriate for intergenerational discounting. There is wide support for this view in the academic literature, and it is recognized in Circular A-4 itself."[67] The Safe Drinking Water Act's focus on health effects to "infants, children, [and] pregnant women"[68] further suggests that overly discounting the benefits to future generations of yet-to-be-born children would be inappropriate.

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[63] 84 Fed. Reg. at 61,727-29.

[64] Economic Analysis at 7-3, n.95 ("The value of an IQ point decrement is the present value of the loss of income over a lifetime where people are assumed to work to age 65. Therefore, the value of future earnings is discounted back to the year in which the IQ decrement is valued in SafeWater LCR, which is age seven. So, the value of lost income at age 65 is discounted over 58 years to age seven, and the value of lost income at age 65 is discounted over 57 years to age seven, and so on.").

[65] *Id.* at 6-40 ("IQ benefits are captured using an average lifetime blood lead level from birth to age 7 and calculated for 7-year-olds within SafeWater LCR. However, these benefits are subsequently further discounted back to year one of the analysis and annualized within SafeWater LCR. This means that benefits that are accrued for 7-year-olds in year 25 of the analysis, for example, would have the relevant discount rate applied for each of the 24 years that have passed since year one of the analysis.").

[66] Circular A-4 at 35-36; *see also* CEA, *Discounting for Public Policy*, *supra*, at 12 ("Intergenerational ethical considerations and greater uncertainty about the investment environment and economic growth in the far future would tend to support lower discount rates in this context. This point is partially addressed in the current discounting guidance in A-4, but is worthy of additional study and public comment should the guidance be revisited—with plausible estimates based on past data and current market- and survey-based forecasts of at most 2 percent."); Maureen Cropper, *How Should Benefits and Costs Be Discounted in an Intergenerational Context?,* 183 RESOURCES 30 (2013); Kenneth Arrow et al., *Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation?*, 272 Science 221 (1996); Kenneth J. Arrow et al., *Determining Benefits and Costs for Future Generations*, 341 SCIENCE 349 (2013).

[67] Interagency Working Group on the Social Cost of Carbon, *Response to Comments: Social Cost of Carbon for Regulatory Impact Analysis* at 36 (2015), https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc-response-to-comments-final-july-2015.pdf. The Interagency Working Group was coordinated by OMB, and the "Response" was to comments solicited in 2013 by OMB, *see id.* at 2.

[68] Safe Drinking Water Act § 1412(b)(3)(C)(i)(V).

Moreover, the intergenerational benefits involve future earnings to individuals, which will directly affect private consumptions decisions of individuals much more so than the use of capital in the private sector. For this reason, too, Circular A-4 would indicate a preference for a 3% or lower discount rate.[69]

Additionally, the benefits include earnings that will be generated up to 93 years from now. Over such a long time horizon, uncertainty points toward selecting a lower discount rate. As Circular A-4 notes, "[p]rivate market rates provide a reliable reference for determining how society values time within a generation, but for extremely long time periods no comparable private rates exist."[70] Circular A-4 further discusses how uncertainty over long time horizons drives the discount rate lower: "the longer the horizon for the analysis," the greater the "uncertainty about the appropriate value of the discount rate," which supports a lower rate.[71] Circular A-4 cites the work of renowned economist Martin Weitzman and concludes that the "certainty-equivalent discount factor . . . corresponds to the minimum discount rate having any substantial positive probability."[72]

Finally, as mentioned above, both the 7% and even the 3% discount rates from Circular A-4 are based on outdated data, and the Council of Economic Advisers recently recommended reviewing and reducing both rates. Note similarly that Circular A-4 originally based its discount rates on Circular A-94,[73] which OMB continues to use to set discount rates for federal lease-purchases and cost-effectiveness analysis,[74] and the latest update to Circular A-94 shows that current long-run discount rates are historically low. In the December 2019 update, OMB found that the real 30-year discount rate is 0.4%, the lowest rate since OMB began tracking the number.[75]

In short, a 7% discount rate is simply not the most appropriate rate to apply to intergenerational benefits that will affect yet-to-be-born Americans' future earnings potentials over the course of the next century. A 3% or lower discount rate is likely more appropriate.

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[69] Circular A-4 at 33. *See also* CEA, *Discounting for Public Policy*, *supra*, at 3 (drawing a connection between individuals' earnings rates on personal savings and the tax-free rate of return on government bonds or other low-risk securities); Nat'l Acad. of Sci., *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide* at 19 (2017) (recommending a focus on "consumption rates of interest" to select discount rates for long-term climate effects).

[70] *Id.* at 36.

[71] *Id.*

[72] *Id. See also* CEA, *Discounting for Public Policy*, *supra*, at 9 ("Weitzman (1998, 2001) showed theoretically and Newell and Pizer (2003) and Groom et al. (2007) confirm empirically that discount rate uncertainty can have a large effect on net present values. A main result from these studies is that if there is a persistent element to the uncertainty in the discount rate (e.g., the rate follows a random walk), then it will result in an effective (or certainty-equivalent) discount rate that declines over time. Consequently, lower discount rates tend to dominate over the very long term, regardless of whether the estimated investment effects are predominantly measured in private capital or consumption terms (see Weitzman 1998, 2001; Newell and Pizer 2003; Groom et al. 2005, 2007; Gollier 2008; Summers and Zeckhauser 2008; and Gollier and Weitzman 2010)."); Nat'l Acad. of Sci, *supra*, at 171 ("[P]ersistent uncertainty about future discount rates mathematically leads to a declining certainty-equivalent rate . . . A considerable literature has grown up around this issue and demonstrated that such declining rates arise regardless of whether discounting uses a descriptive or prescriptive approach."); *id.* at 18 (recommending explicit recognition of the "uncertainty surrounding discount rates over long time horizons"); Kenneth J. Arrow et al., *Should Governments Use a Declining Discount Rate in Project Analysis?*, 8 Rev. Envtl. Econ. & Pol'y 145 (2014); Maureen L. Cropper et al., *Declining Discount Rates*, 104 Am. Econ. Rev.: Papers & Proc. 538 (2014); Christian Gollier & Martin L. Weitzman, *How Should the Distant Future Be Discounted When Discount Rates Are Uncertain?*, 107 Econ. Letters 3 (2010); Li & Pizer, *supra* (on rethinking the discount rates from Circular A-4, especially in the face of uncertainty and intergenerational effects).

[73] Circular A-4 at 33.

[74] *See* OMB, *2020 Discount Rates for OMB Circular No. A-94* (Dec. 17, 2019), https://www.whitehouse.gov/wp-content/uploads/2019/12/M-20-07.pdf

[75] OMB, *Nominal Treasury Interest Rates for Different Maturities (from the annual budget assumptions for the first year of the budget forecast)* (Nov. 5, 2019), https://www.whitehouse.gov/wp-content/uploads/2019/12/discount-history.pdf.

3. EPA Should Consider Additional Alternatives That May Better Maximize Net Welfare or Address Environmental Justice

Besides proposing compliance alternatives for small community water systems and non-transient/non-community water systems,[76] EPA provides a detailed analysis of only four regulatory options, which focus on schools, sampling protocol requirements, publication of locational information, and small system flexibility.[77] Otherwise, EPA only generally asks for public comments on whether the agency should consider, for example, a different trigger level or the feasibility of a different pace for lead service line replacements,[78] rather than analyzing such alternatives for itself.

The lack of alternatives for which EPA provides details and analysis is inconsistent both with statutory requirements to consider alternatives,[79] as well as with best practices for regulatory analysis. Despite EPA's recognition that Circular A-4 "recommends careful consideration 'of all appropriate alternatives for the key attributes or provisions of a rule,'"[80] EPA does not fully explore even one of the most fundamental categories of alternatives: different degrees of stringency.[81] Instead, EPA announces with very little explanation that it is not changing the lead action level of 15μg/L, which was originally based not on the level required to adequately protect health but instead on a 1991 feasibility determination (which the agency is also not revisiting, despite the significant amount of time that has elapsed since 1991).[82] And while EPA proposes a new "trigger level" for lead to compel some early precautions before systems reach the full action level, EPA presumes with little explanation that 10μg/L is a "reasonable threshold" for the trigger level.[83] Rather than exploring for itself whether alternate action levels or trigger levels would better maximize net welfare, EPA simply asks the public for comments on whether its proposed trigger level is appropriate.[84]

Given the significance of non-monetized benefits, and given the strong reasons to focus on cost-benefit calculations at a 3% or lower discount rate, it is very possible that a more protective alternative would better maximize net welfare. It is also possible that a different alternative would better advance environmental justice goals while remaining cost-benefit justified. EPA should consider the costs and benefits of a broader range of alternatives, and then select the alternative that best maximizes net public welfare and advances environmental justice.

Sincerely,

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[76] 84 Fed. Reg. at 61,700.
[77] *Id.* at 61,731.
[78] *Id.* at 61,735.
[79] Safe Drinking Water Act § 1412(b)(3)(C)(i) (requiring analysis and publication of factors like quantifiable and nonquantifiable health benefits for "each alternative maximum contaminant level that is being considered"); *id.* § 1412(b)(3)(C)(ii) (requiring publication of cost-benefit analysis for "alternative treatment techniques that are being considered").
[80] 84 Fed. Reg. at 61,731.
[81] *See* Circular A-4 at 8.
[82] 84 Fed. Reg. at 61,691.
[83] *Id.*
[84] *Id.* at 61,735.